

Report No:
Anytime Fitness Hayling Island Noise Impact Assessment

Date:
24th February 2025

For:
MS Singh
Anytime Fitness Hayling Island

Report Title:

ANYTIME FITNESS HAYLING ISLAND NOISE IMPACT ASSESSMENT

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REVISION SCHEDULE

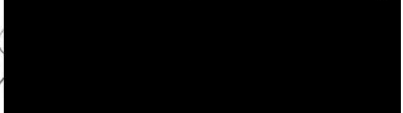
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INTRODUCTION

A new Anytime Fitness gym is proposed to be located on the first floor of 12 Mengham Road, Hayling Island PO11 9BL. The gymnasium is situated within the Borough of Havant. Gillieron Scott Acoustic Design have been commissioned to undertake an acoustic assessment of the potential noise and vibration transmission from gym activities at nearby receptors, and to provide mitigation measures where necessary.

The nearest noise-sensitive premises are the residents on the first floor of 14 Mengham Road. The proposed site is located directly above a Sainsbury's Local supermarket and is part of a series of terraced properties constructed in the 1950s on the main shopping high street in Mengham, Hayling Island. The property was also previously used as a gym. Anytime Fitness are proposing to refurbish the existing space but to maintain its existing function as a gym.

The gym is proposed to operate between 06:00-22:00 hours, Monday to Sunday.

The acoustic assessment considered various noise sources, including airborne noise from its usage e.g. through sound systems and group classes, as well as impact noise e.g. from free weights. Design targets have been set to minimise the likelihood of complaints arising from the adjoining premises.

Plant units have not been selected at this stage, noise limits at 1m from nearest noise sensitive properties have been provided.

The findings of this assessment are presented in the following sections of this report, together with the supporting figures and appendices.

1.0 BRIEF

Identify noise sensitive premises located in the vicinity of the site and assess potential routes of noise and vibration transmission.

Undertake airborne and weight-drop impact sound transmission from the proposed Anytime Fitness gymnasium to adjoining premises.

Analyse the site-acquired data and determine the appropriate noise criteria to adopt from the Local Authority noise policy.

Provide a technical report detailing findings of the survey and provide appropriate noise mitigation measures, where required, to mitigate internal noise transfer from gym usage and sound systems to ensure design targets are met.

2.0 SUMMARY

2.1 Noise from gym usage and sound systems

Similar to other ATF gyms, the fit-out and gym usage plans assume the following measures have been taken to control noise:

All machines will be fitted with earphone sockets so members can use sound functions without disturbing others.

Free weights kit will have absorbing mounts.

Weights/running machines to be fitted with impact absorbers/treadmill packs (Appendix F & G).

On-site weight-drop tests have been undertaken from the proposed free-weights area to the adjacent residential flat and to the Sainsburys below. Results show that the installation of a double layer of Duraflex matting to the weights area will provide the best level of mitigation to both the neighbouring residential and the commercial premises below.

Strict management control and CCTV monitoring of patrons unreasonably dropping weights onto the flooring in a deliberate manner. Typical policy below:

“As a policy for Anytime Fitness we will do our best to ensure that members do not drop cable station weights for any undue reason. Frequent abusers will be warned and if they do not stop, will have their memberships revoked. With video monitoring in use, any unmanned hours can be monitored post any reported event. Any complaint received we will review the video footage and members contacted to prevent this from being an issue in the future. We will also have a list of member rules and club etiquette clearly visible for all members to view.”

On-site airborne sound insulation tests have confirmed the noise limit in all areas of the gym is to be set at 88 dB(A) $L_{Aeq,1min}$. Improvements to the sound insulation of the building e.g. glazing and party wall construction may allow this limit to be increased.

On first opening of gym, music sound levels will be set and locked to those specified in Section 6 to ensure design targets are met in all adjoining premises and that music meets the required Gym Acoustics Guide Guidance in surrounding residential dwellings. Octave band music sound levels to meet this criterion are defined within this report in section 6.1.2.

Gym windows being non-openable and specified to ensure external noise levels meet design criteria. Comfort cooling to be provided by air conditioning.

Position weight stacks or high impact elements away from structurally adjoining elements and the structural building core to avoid structure borne transmission of impact noise.

Lagging of RWP/drainage/soil vent/waste pipes with acoustic lagging (10kg/m²).

GSAD expect that if these measures are incorporated into the design, the likelihood of complaints will be low.

3.0 NOISE ASSESSMENT CRITERIA

3.1 Noise from gym usage and sound systems

The gym is proposed to operate between 06:00-22:00 hours, Monday to Sunday.

The noise emanating from the user activities within the gym such as free weights, running machines or group classes into structurally adjoining residences will be designed to meet BS 8233:2014 recommended internal noise levels always.

Additionally, noise from amplified music systems should be set so that it does not exceed Gym Acoustic Guideline Level within surrounding and structurally adjoining residential premises and retail units.

3.2 British Standard BS 8233:2014

British Standard BS 8233:2014 provides information on the design of internal acoustics in buildings. The document gives recommended internal noise levels in residential dwellings and commercial buildings. The recommendations are shown below.

3.2.1 Residential Dwellings

Table 1: BS8233 Indoor Ambient Noise Level Targets

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

The 2014 revision of BS 8233 has removed specific references to a recommended level from individual noise events (measured as L_{Amax}). The guidance from the World Health Organisation (WHO) will be used in lieu of a definitive steer in the BS 8233 document. A WHO 2000 document recommends the 45 dB L_{Amax} is not regularly exceeded in bedrooms at night. A further WHO document details that more than around 10 events a night would constitute as 'regularly exceeded'.

The above limits are based on research into the effect of noise on the health and quality of life of occupants subjected to noise.

3.2.2 ProPG Gym Acoustic Guidelines (GAG)

The following table notes the criteria to Residential Areas from airborne Sound and Weight Drops and notes limitations should be placed along third-octave bands.

The lower targets in the stated ranges will be targeted where possible in this development.

Table 2: Guidance Internal Sound Target Criteria for Gym Activity – Residential & Other Areas

Receptor type	Guide Criteria (for third octave band values plots against the stated G curve - see Figure 2)	
	Airborne Sound (e.g., music) $L_{eq,T}$ (31.5Hz to 8kHz)	Heavy Impact Sound $L_{max,F}$ (31.5Hz to 8kHz)
Commercial Offices	G25-G35	G35-G45
Retail Areas	G30-G45	G35-G50
Residential Areas	G15-G25 (day) G10-G20 (night)	G20-G25 (day) G15-G20 (night)

The Working Group generally found in their experience that levels below the upper values tended to avoid significantly adverse impacts (SOAEL) occurring and higher levels than these should generally be avoided, but this is highly dependent on context. The background and ambient noise levels at any given site can fluctuate (e.g., a building in an urban setting adjacent to busy infrastructure versus a building shielded from external adverse noise intrusions and/or quieter location). This variation will also cause a subjective variance in relation to the perceived noise impact, both during the design phase and the completed development and the Suitably Qualified Acoustician should be cognisant of which target criteria would be most appropriate to their Gym scheme.

The G-Curve targets in octave bands are displayed below.

Table G1: G Curve values between 31.5Hz and 4kHz

G Curves	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz
G50	84	78	71	67	64	61	58	56	54	52	50	49	48	47	46	45	44	43	42	41	41	40
G45	81	74	68	63	59	57	54	52	50	48	46	44	43	42	41	40	39	38	37	36	36	35
G40	78	70	64	59	55	52	50	47	45	43	41	39	38	37	36	35	34	33	32	31	31	30
G35	74	67	60	55	51	48	45	43	41	38	36	34	33	32	31	30	29	28	27	26	25	25
G30	71	63	56	51	47	44	41	38	36	34	31	30	28	27	26	25	24	23	22	21	20	20
G25	67	59	52	47	43	40	37	34	31	29	27	25	23	22	21	20	19	18	17	16	15	14
G20	64	56	49	43	39	35	32	29	27	24	22	20	18	17	16	15	14	13	12	11	10	9
G15	61	52	45	39	35	31	28	25	22	20	17	15	14	12	11	10	9	8	7	6	5	4
G10	57	49	41	35	31	27	24	21	18	15	13	10	9	7	6	5	4	3	2	1	0	-1

In the context of this site, GSAD propose the lower end of the G-Curve ranges should be targeted where possible, however meeting the upper target will still indicate a low impact. In the context of the residential dwelling, the upper level of the night-time criteria should be targeted due to the 6am opening hours – or a stricter control of activities between 06:00-07:00 should be considered. Due to the higher background noise levels in the commercial premises, the higher G-Curve values are acceptable. These targets are more onerous and rigorous than BS8233 levels. Achieving the proposed G-Curves will in turn show compliance with BS8233 targets.

3.3 Noise from Plant Units

3.3.1 British Standard 4142: 2014+A1: 2019

BS4142:2014+A1:2019 provides methods for rating and assessing industrial and commercial sound. The standard is used to rate sound from fixed installations. The standard requires a “Specific Sound Level”, in terms of L_{Aeq} , is determined either by measurement or calculation at a receptor location. This Specific Sound Level may then be corrected for the character of sound and is then termed the “Rating Level”.

Once the Rating Level has been determined, the background sound level is subtracted from it and the greater the difference, the greater the likelihood of an ‘adverse impact’. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. The standard advocates that each site and situation should take the context of the scenario into consideration and that “not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact”.

The standard provides reference periods over which the assessment should take place which have been reproduced in the table below.

Table 2 – Reference Periods

Period	Hours
Typical Daytime	07:00 – 23:00
Typical Night-time	23:00 – 07:00

3.3.2 Local Authority Noise Policy

Havant Borough Council’s policy, contained in ‘Local Information Requirements Havant Borough Council Implementation Date: 12 December 2022’ for plant and machinery noise is referenced below:

“Details of the position and design of ventilation and extract must be submitted. Noise assessment shall be based on BS 4142 - 2014; and cover the time period when the extract or ventilation system will be operational.”

3.3.3 Noise Impact Assessment

A background noise survey was undertaken between 20:15 on Friday 25th August and 05:15 on Tuesday 29th August 2023 at a single fixed monitoring location that was located on the roof of the site to establish a limiting noise level for new items of plant to ensure they do not exceed National and Local standards.

Plant units have not yet been selected. A summary of the measured representative background noise levels is presented below. The rating noise level from all new items of plant should not exceed these levels at 1m from the façade of nearby noise sensitive receptors to meet National standards and Local Authority criteria. Once plant selections and locations have been made, a full noise impact assessment will be undertaken.

Table 3 – Representative Background Noise Levels – Maximum Plant Noise Emission Levels

Representative Background Noise Level L_{A90}	
Daytime (07:00-23:00hrs)	Night-time (23:00-07:00hrs)
51 dB(A)	34 dB(A)

4.0 ACOUSTIC TESTING AND SURVEYS

4.1 Noise from gym usage and sound systems

Airborne sound and structure-borne impact sound acoustic transmission testing of the separating construction and proposed impact isolation products has been undertaken to ensure that noise emanating from the gym meets the specified design targets from section 3 of this report. These tests have been carried out in order to minimise the likelihood of complaints arising from the adjoining residential premises.

4.2.1 Airborne sound testing

Airborne sound insulation tests were carried out with regard to BS EN ISO 140-4 and Annex B of the Approved Document E in Building Regulations 2003 (as amended).

A continuous and steady spectrum of pink noise was generated through one loudspeaker in the source room.

The sound pressure level (SPL) in the source and the receiving rooms was sampled for at least 30 seconds using a moving microphone to obtain the spatial average SPL.

The noise source was moved to a second position and the sampling process repeated.

Background noise levels were also measured in the receiving room for at least 30 seconds using a moving microphone.

Reverberation times have been estimated in receiver rooms in order to avoid disturbance to the adjoining commercial premises.

As per Annex B of ADE, for each loudspeaker position the level difference between the two rooms is determined and the two (or more) differences averaged to arrive at the mean difference D for each third-octave band. Subsequently the standardised level difference D_{nT} is calculated:

$$D_{nT} = D + 10 \log \frac{T}{T_0} \text{ dB}$$

Where

- D_{nT} is the standardised level difference
- D is the mean level difference
- T is the reverberation time (RT) measured
- T_0 is the reference RT (0.5 seconds)

The results were subsequently rated in accordance with BS EN ISO 717-1 to obtain the weighted standardised level difference $D_{nT,w}$ and the spectrum adaptation terms C and C_{tr} .

Airborne sound transmission tests were carried out between the proposed gym and the residents adjacent.

4.2.2 Impact Sound Transmission

The following impact isolation mat build-ups were tested with weight drops of a 20kg dumbbell in the proposed weights area of the gym. These were measured in the adjacent residential dwelling, as well as in the shop floor of the Sainsburys below:

70mm GenieMat FIT70

Duraflex¹

Double Layer of Duraflex¹

ECORE FL5 Alt3 15mm²

ECORE Performance dB Tile Dark Grey (ST2.5DG) 63.5mm²

25mm Sylomer R42s (added in combination with above, excluding with Ecore 63.5mm mat)

¹Additional mats provided by client. Please provide full details of materials for inclusion.

²Mats provided by ATF. Please provide full details of materials for inclusion.

Samples of impact isolation matting were placed directly on the floor. A single dumbbell weighing 20kg was dropped onto the samples of impact isolation matting from a standardised height of approximately 0.5m while the resultant noise level was measured within adjoining premises.

The results of the impact testing are presented in Section 5.1.2 Impact Sound Transmission from Weights Area.

It is understood that the free weights area will contain weight benches and racks for dumbbells. There will be no designated area for dropping. It is the standard policy of Anytime Fitness that it is not permitted to unreasonably drop dumbbells from any height. This is closely managed via onsite staff, CCTV monitoring and with signage in appropriate areas and as such should be a rare event.

4.2.3 Weights Machines

There were no weights machines on site at the time of testing. Based on tests previously undertaken at similar sites, dumbbell drops are more energetic than weight machine use therefore represent a worst-case scenario.

4.2.4 Treadmills

No treadmills were on site at the time of testing and therefore noise transmission levels could not be measured. It is recommended that treadmills are located away from the separating wall to the neighbouring residential unit and installed onto isolation pads e.g. TVS RESi Treadmill Pads.

5.0 SURVEY RESULTS

5.1 Noise from typical gym usage and sound systems

5.1.1 Airborne Sound Transmission

Airborne sound insulation was measured between the proposed gym the neighbouring residential dwelling, into two bedrooms and a living room. A measurement of the external façade/glazing performance was also undertaken from within the main gym space to 1m from the facade. Table 2: Airborne Sound Insulation Results summarises the results of the airborne sound separation measured on site.

Table 2: Airborne Sound Insulation Results

Source room	Receiving room	D _{nT,w} (dB)
Main Gym Space	14 Mengham Road Bedroom	70
Main Gym Space	14 Mengham Road Bedroom	70
Main Gym Space	14 Mengham Road Living Room	72
Main Gym Space	1m from Façade (glazing)	36 D _w *

*Internal to external measurement does not include reverberation time, therefore given as D_w measurement.

Sound insulation to the commercial unit below could not be measured during the initial visit, please provide floor build-up details for our review.

Graphical representations of the results for the residential tests are found in APPENDIX H: Sound Insulation Testing Results, including third octave band spectral results. The façade/glazing test has been processed separately.

5.1.2 Impact Sound Transmission from Weights Area

The results of impact testing carried out between the gym and adjoining premises is presented in 6.1.3 Impact sound transmission from weight drops/ dumbbells.

5.2.3 Impact Sound Transmission from Machines

No machines are currently installed at the site. Free-weight drops are predicted to be worse than from machines, however it is recommended that dampening materials are installed to reduce the impact of machine weight drops. Product details are given in Appendix F & G.

6.0 ACOUSTIC ASSESSMENTS

6.1 Noise from gym usage and sound systems

6.1.1 Airborne sound insulation

The proposed activities on the first floor include cardiovascular equipment, functional fitness areas, resistance equipment and a studio. Full details of proposed activities and updated layout of the space should be issued to GSAD for review.

Calculated from tested partition sound insulation performances and breakout noise levels through the façade/glazing to nearby residential dwellings, noise levels from all spaces should be limited to 88 dB(A) $L_{eq,1min}$ cumulatively – this includes amplified music. Internal noise levels are limited by the current glazing performance, if internal noise levels are to be increased then existing glazing should be improved.

The current construction details of the building are not known. The existing sound insulation between the first floor gym space and neighbouring flats was measured at 70-72 dB $D_{nT,w}$. Performance of the external façade/glazing was measured at 36 dB D_w . The internal door separating the main gym and studio spaces also measured at 29 dB $D_{nT,w}$ (approximately 36 dB R_w).

Once full details of the proposed usages are provided, GSAD can assess the potential internal noise levels and recommend further upgrades to the existing façade where necessary.

6.1.2 Internal noise limit for sound systems and group activities

From the measurement of airborne sound insulation between the proposed gym and surrounding rooms and the predicted performance of the proposed upgrades allows maximum permitted internal noise levels to be calculated. These levels have been defined to ensure design criteria in Section 3 is met for all adjoining premises and nearby residential premises. These maximum levels are presented below in Table 3. We advise limiting third octave bands such that tonal noise is controlled. It is assumed that gym windows will be non-openable and specified to ensure external noise levels meet design criteria, with comfort cooling provided by air conditioning. However please note that if windows are opened, the external façade sound insulation performance will be significantly reduced, and a lower internal noise levels will be required.

Table 3: Approximate Limiting Noise Levels $L_{eq,1min}$ (dB) per frequency (Hz)

Limit	All areas
Frequency (Hz)	
63	89
125	89
250	87
500	87
1000	83
2000	78
4000	73
dBA	88

On first opening of the gym, locking music sound levels to a maximum of the values in the table above will minimise the risk of complaint from the neighbouring premises. These levels have been calculated based on the measured acoustic performance of the party walls, floors/ceilings and external facade to ensure activity within the gym is unlikely to give rise to complaint in surrounding residential dwellings.

6.1.3 Impact sound transmission from weight drops/ dumbbells

Testing has taken place on isolation matting build-ups. Tests have determined that weight drop events within the dumbbell area in the gym will have a low level of audibility at very low frequencies in the surrounding premises based on the proposals outlined.

The results of impact testing carried out between the first-floor weights area, the neighbouring residential, the Sainsburys shopfloor and storeroom. Where weight drop measurements were lower than the background noise level it is assumed that noise from the weight drop was at least 10 dB below the background.

Table 4 - Impact Sound Transmission Test Results to above

Source room	Receiving room	Isolation mat Build-up	G-Curve L _{max}	L _{max} Criteria	PASS/FAIL
Proposed Gym Space	14 Mengham Road, Bedroom	Ecore Performance dB	47	G-15 – G-20	FAIL
		Geniemat FIT70	21	G-15 – G-20	FAIL
		Duraflex	24	G-15 – G-20	FAIL
		Double Duraflex	20	G-15 – G-20	PASS
		Ecore FL5	42	G-15 – G-20	FAIL
		Geniemat + Sylomer	31	G-15 – G-20	FAIL
		Duraflex + Sylomer	31	G-15 – G-20	FAIL
		Ecore FL5 + Sylomer	28	G-15 – G-20	FAIL
Proposed Gym Space	Sainsbury's Shop Storeroom	Ecore Performance dB	78	G-35 – G-50	FAIL
		Geniemat FIT70	55	G-35 – G-50	FAIL
		Duraflex	57	G-35 – G-50	FAIL
		Double Duraflex	48	G-35 – G-50	PASS
		Ecore FL5	68	G-35 – G-50	FAIL
		Ecore FL5 + Sylomer	40	G-35 – G-50	PASS
		Duraflex + Sylomer	41	G-35 – G-50	PASS
		Geniemat + Sylomer	46	G-35 – G-50	PASS
Proposed Gym Space	Sainsbury's Shop	Geniemat + Sylomer	52	G-35 – G-50	FAIL
		Geniemat FIT70	53	G-35 – G-50	FAIL

		Duraflex + Sylomer	54	G-35 – G-50	FAIL
		Duraflex	54	G-35 – G-50	FAIL
		Double Duraflex	47	G-35 – G-50	PASS
		Ecore FL5 + Sylo	46	G-35 – G-50	PASS
		Ecore FL5	46	G-35 – G-50	PASS

From the tests undertaken, it has been found that a double layer of Duraflex should be installed to suitably mitigate noise from weight-drops within the free-weights and dumbbell area on the first floor, to meet criteria at the adjacent neighbours residence and the Sainsbury's shop on the ground floor below the gym.

The background noise levels have been measured at 30dB(A) in the neighbouring residence, 59dB(A) in the Sainsburys Storeroom and 53dB(A) in the Sainsburys Shopfloor. Due to the higher background noise in Sainsburys and the higher criteria limit, more mats passed the performance tests. However, as only the double layer of Duraflex passed the criteria of G20 within the residential dwelling, this specification is proposed.

6.1.4 Noise from continuous gym activity

The noise limits inside the gym have been set to 88dB(A) to ensure design targets are met and minimise the likelihood of complaint. This is based on airborne sound transmission tests carried out on site and calculations to the surrounding noise sensitive locations.

A full list of the proposed activities within the gym should be provided to GSAD for review to assess against the internal noise level targets so that we can propose additional mitigation measures where appropriate.

Assuming gym activity is controlled as per the Anytime Fitness management policy outlined in section 2.1 and that these activities will not exceed 88dB(A) in the gym, the design criteria will be met.

Structure-borne impact noise from gym activities has been addressed by section 6.1.3 and the mitigation measures are shown in Appendix F & G.

7.0 CONCLUSION

Suitable noise level targets for breakout from airborne and impact gym activities have been defined in residential dwellings by following British Standard BS 8233:2014 guidelines and ProPG Gym Acoustic Guidelines (GAG).

Suitable acoustic testing, including airborne sound insulation and impact sound transmission tests, has been undertaken in the proposed gym. The results have been used to indicate effective measures to implemented to minimise noise disturbance.

Suitable airborne sound insulation measures have been suggested to meet the design targets set out in section 3.0 for each part of the Gym. Noise from amplified music will need to be suitably limited to meet the required design targets.

Based on the results of the impact testing, a suitable matting build up has been suggested. It is understood that Anytime Fitness will manage the space to prevent weight dropping. Based on the testing undertaken a low impact should be achieved with suggested build ups on the gym floor.

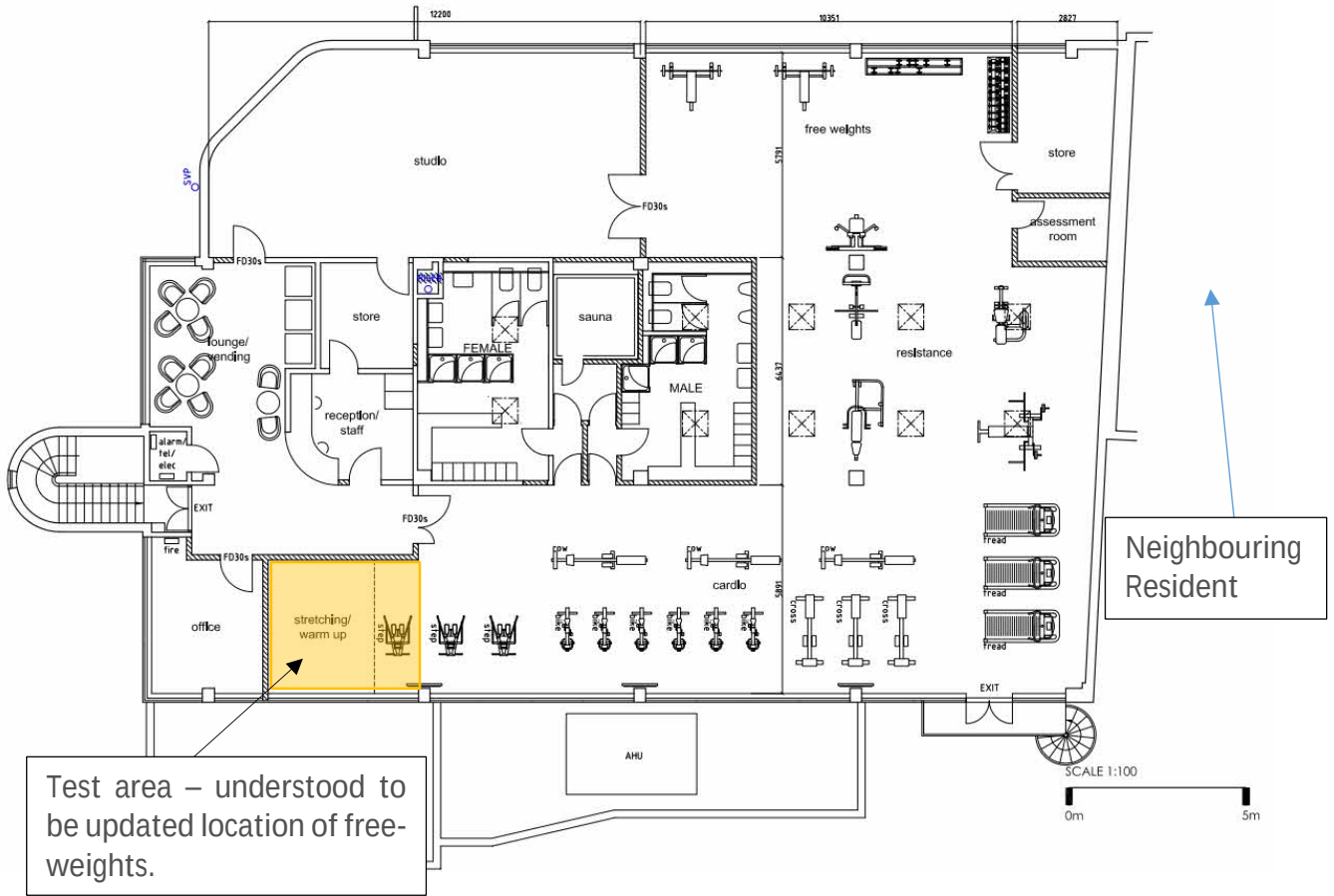
Should a higher internal noise limit be required, additional mitigation measures should be employed e.g. improving glazing performance or through isolation of the gym from the surrounding structure e.g. box-in-box construction.

APPENDICES

APPENDIX A - Site Location



APPENDIX B – Proposed Gym Layout and Mitigation Measures



Please provide updated drawings of equipment locations. It is understood that the free-weights area is to be located where testing was undertaken, as highlighted above, not located next to the neighbouring resident.

APPENDIX C – Resilient Floor Matting Details

Duraflex – Please provide manufacturer’s details of Duraflex Matting (ATF product)

Ecore FL5 Alt3 – Please provide manufacturer’s details of Encore FL5 matting (ATF product)

Ecore Performance dB – Please provide manufacturer’s details of Encore Performance dB matting (ATF product)

Sylomer



Material mixed cellular polyurethane
Colour pink

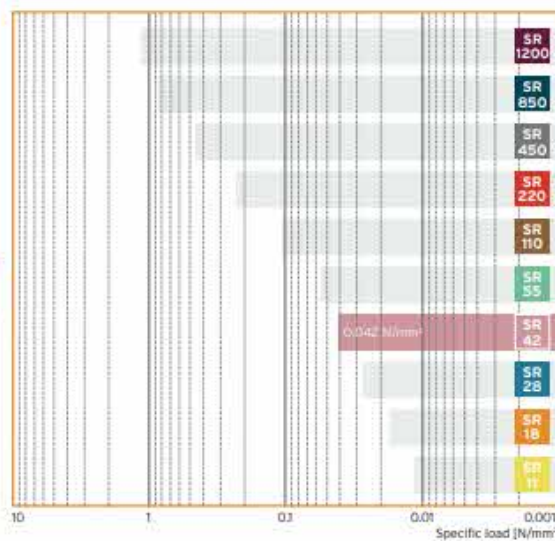
Standard dimensions on stock

Thickness: 12.5 mm with Sylomer® SR 42 - 12
25 mm with Sylomer® SR 42 - 25
Rolls: 1.5 m wide, 5.0 m long
Stripes: max. 1.5 m wide, up to 5.0 m long

Other dimensions (also thickness) as well as stamped and molded parts on request.

Standard Sylomer® range
Static range of use

Area of application	Compression load	Deflection
	depending on form factor, values apply to form factor 3	
Static range of use (static loads)	up to 0.042 N/mm ²	approx. 7 %
Operating load range (static plus dynamic loads)	up to 0.057 N/mm ²	approx. 20 %
Load peaks (short term, infrequent loads)	up to 2 N/mm ²	approx. 80 %

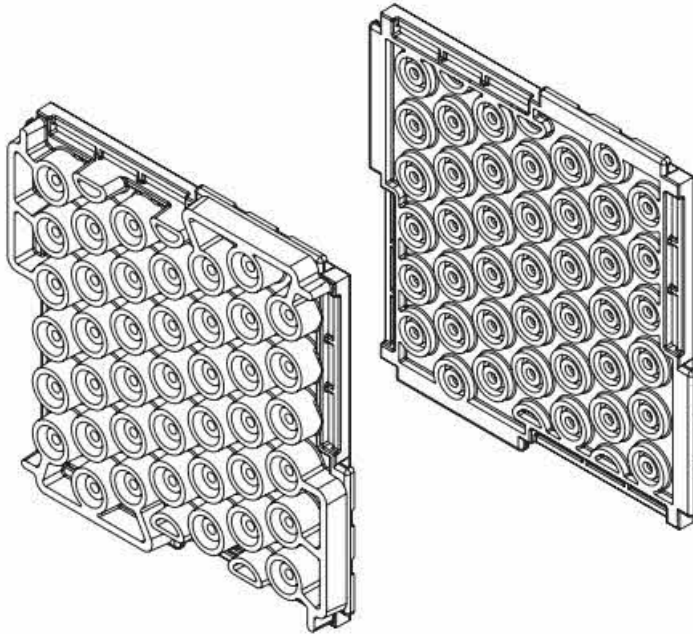


Material properties		Test methods	Comment
Mechanical loss factor	$\eta = 0.16$	DIN 53513*	depending on frequency, load and amplitude
Rebound elasticity	55 %	DIN 53573	tolerance ± 10 %
Compression set	< 5 %	EN ISO 1856	50 %, 23 °C, 70 h, 30 min. after unloading
Static shear modulus	0.08 N/mm ²	DIN ISO 1827*	at specific load of 0.042 N/mm ²
Dynamic shear modulus	0.17 N/mm ²	DIN ISO 1827*	at specific load of 0.042 N/mm ² , 10 Hz
Coefficient of friction (steel)	$\mu_s = 0.5$	Getzner Werkstoffe	dry
Coefficient of friction (concrete)	$\mu_a = 0.7$	Getzner Werkstoffe	dry
Abrasion	1200 mm ³	DIN 53516	load 7.5 N, bottom surface
Operating temperature	-30 to 70 °C		short term higher temperatures possible
Specific volume resistance	> 10 ⁸ Ω·cm	DIN IEC 93	dry
Thermal conductivity	0.07 W/(mK)	DIN 52612/1	
Flammability	B2 class E	DIN 4102 EN ISO 11925-2	normal flammable EN 13501-1

GenieMat Fit 70

GENIEMAT® FIT

For Weight Drop Impact Insulation



GENIEMAT® FIT

All-in-one fitness flooring

PRODUCT FEATURES

GenieMat FIT is an all-in-one fitness floor made from recycled rubber, engineered to reduce structure-borne sound and vibration transmission in concrete, wood frame and metal deck construction.

GenieMat FIT floors dramatically reduce low frequency impact noise in free weight areas, under cardio equipment and in fitness studios.

	GenieMat FIT08		GenieMat FIT30	GenieMat FIT70
Weight per tile/roll	77 kg/roll		9.4 kg/tile	16.7 kg/tile
Thickness	8 mm		30 mm	70 mm
Installed Dimension	1220 mm x 7620 mm	587 mm x 587 mm	607 mm x 607 mm	607 mm x 607 mm
Product Type	Roll	Puzzle	Interlocking Tile	Interlocking Tile

All listed dimensions are nominal.

GenieMat FIT30 and **GenieMat FIT70** have a product and installed dimension tolerance of ± 3 mm.

APPENDIX D - Equipment and Procedure

The following equipment was used during the survey.

The equipment was calibrated before and after the survey and no drift from calibration was found.

Equipment Type	Manufacturer	Type
Sound Level Meter x2	NTi	XL2
Signal Generator	NTi	MP-PRO
Calibrator	Norsonic	1251
Active Loudspeaker on tripod	Mackie	Thump 12

APPENDIX E - Glossary of Acoustic Terms

DECIBEL (dB) - A unit of sound pressure measurement

Sound Pressure Level in dB (Lp) = $20 \log (\text{Measured sound pressure} / \text{Reference sound pressure} = 20 \mu\text{Pa})$

dB(A) - The A-weighted sound pressure level, the weighting network reduces low frequency sound in a similar way to the human ear.

REVERBERATION TIME (RT or T) – decay of sound in rooms

The time taken for a sound, once terminated, to fall through 60dB i.e. to one millionth of its original sound intensity. T30 – RT for first 30dB of decay. RT₅₀₀ - Mid frequency RT.

HERTZ (Hz) - a unit of frequency measurement. The normal range of hearing is from 20Hz to about 15kHz.

ABSORPTION COEFFICIENT – degree to which a material absorbs sound.

The ratio of absorbed to incident sound energy (perfect absorber = 1)

SOUND REDUCTION INDEX R – quantity which describes a material's ability to reduce the sound pressure level across it (e.g. a wall or floor)

$$R = L1 - L2 + 10 \log (S/A)$$

L1 - Average sound pressure level in source room (averaged from 100 Hz – 3150 Hz)

L2 - Average sound pressure level in receiving room (averaged from 100 Hz – 3150 Hz)

S – Wall Area (m²)

A – Total absorption in receiving room (m² units)

Rw – weighted sound reduction index

AVERAGE ROOM TO ROOM LEVEL DIFFERENCE – D, dB = L1 – L2, averaged 1/3 octave bands from 100Hz – 3150kHz.

Dw – weighted value of D (usually 2 - 3dB higher)

DnT, w – Dw corrected for reverberation time of receiving room

NOISE RATING CURVES (NR CURVES) – set of curves used to describe optimum background noise levels for different tasks.

L10/90 LEVEL (dB) - The level in dB of a time varying sound pressure level (e.g. traffic) exceeded for 10%/90% of the time of measurement.

L90 is usually called the BACKGROUND NOISE LEVEL.

Leq AVERAGE SOUND PRESSURE LEVEL – level dB of a time varying sound pressure level with equal amounts of energy above and below it, for the time of measurement.

TONAL NOISE – noise of a single frequency (or a narrow band of frequencies that can be perceived as a tone), audible above the broad band noise background. Noise which is at least 5dB above the average of the 1/3 octave band sound pressure levels immediately on either side of it.



Technical Information Sheet

TVS Impact Absorbers

Benefits

- Suitable for resistance machines with guides up to 22mm in diameter.
- Reduces impact noise at source.
- Bespoke impact absorbers can be produced to suit different manufacturers equipment.
- Double thickness impact absorbers will further increase acoustic performance.

Description

TVS Impact Absorbers are specially designed to reduce the impact vibration and subsequent structural noise caused by resistance machines in use. Gym equipment mounted in mix use buildings can suffer greatly from this problem but by utilising these TVS Impact Absorbers gym activity can continue without fear of noise complaints.



Physical Information

Height: 25mm $\pm$ 1.5%
Outer Diameter: 50mm $\pm$ 1.5%
Inner Diameter: 22mm $\pm$ 1.5%

- Residual Lfmax Noise Level Due to Stack Weight Drop - Carpet Only - WITHOUT TVS Impact Absorbers
- Residual Lfmax Noise Level Due to Stack Weight Drop - Carpet Only - WITH TVS Impact Absorbers
- Residual Lfmax Noise Level Due to Stack Weight Drop - Carpet Only - WITH 2 x TVS Impact Absorbers



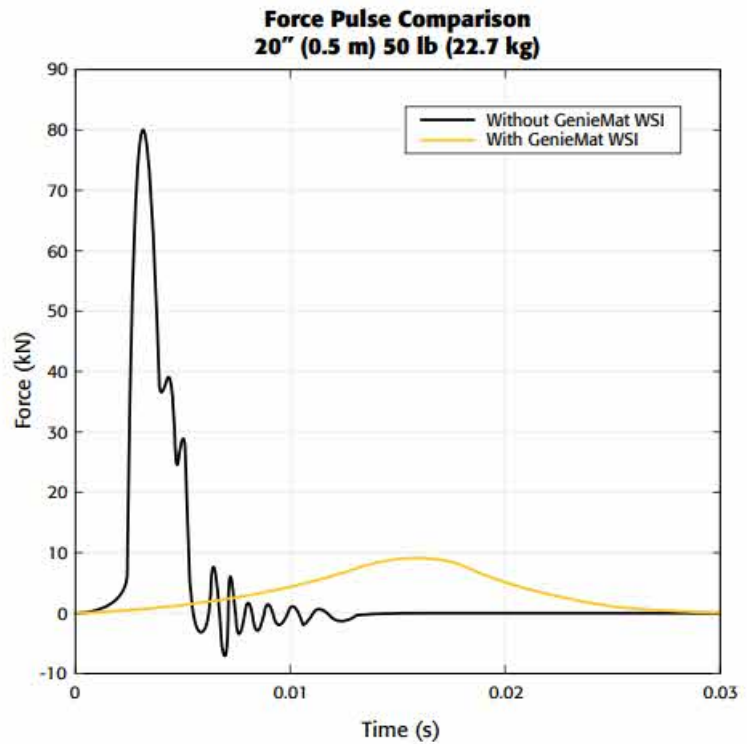
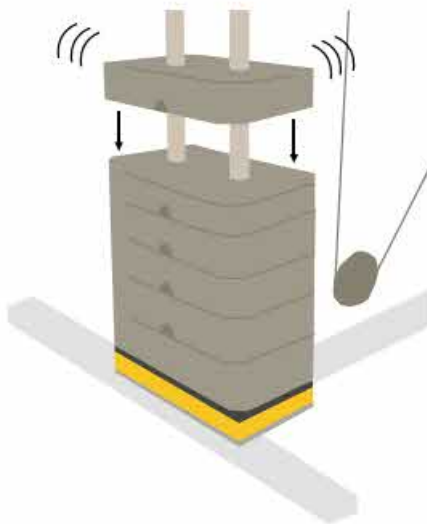
GENIEMAT® WSI

WEIGHT STACK ISOLATORS

Patent pending

GenieMat WSI isolates impact noise from selectorized machines.

- Reduce impact noise at the source
- Customized size to fit every weight stack
- Installation does not require machine disassembly



APPENDIX G: Running machine isolation e.g. TVS RESi Treadmill Pads



Technical Information Sheet TVS RESi Treadmill Pads

Benefits

- Excellent vibration and shock isolation properties.
- Standardised design to fit most major treadmill manufacturers product.
- Low profile design.
- Easy to install.
- Increased comfort for users.
- Safe, non-toxic, non-irritant, recyclable and environmentally friendly.



Noisy Treadmill? Causing problems for your neighbours?

Whether you have multiple banks of treadmills as part of a large gym, or one solitary machine in your apartment, TVS RESi Treadmill Pads offer the ultimate in treadmill isolation.



Utilising a combination of different isolation materials, TVS RESi Treadmill Pads bring military inspired technology to prevent the transfer of noise into other areas of the building.

Designed to be used in combination with the treadmill manufacturers standard feet, these pads offer excellent isolation levels, whilst also providing a stable, non-slip base for the treadmills to sit.

Physical Information

Standard Dimensions: Front Feet – 300mm x 170mm x 50mm (including 10mm Lip)
Rear Feet – 200mm x 130mm x 40mm

Load Capacity: 500kg (spread over the four standard feet)

Installation Guidelines

TVS RESi Treadmill Pads are sold by the set and consist of two front and two rear pads.

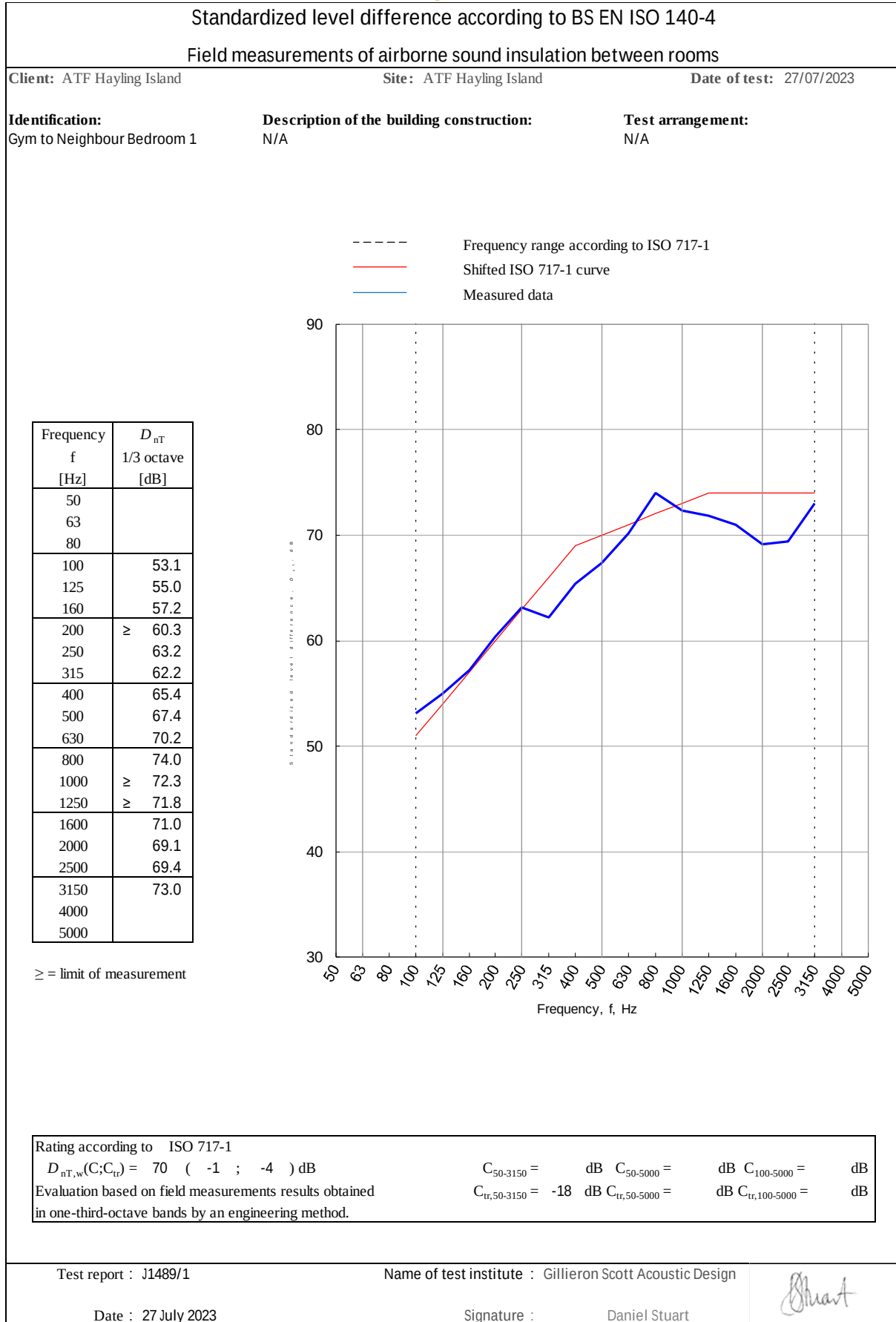
Lift the treadmill according to the manufacturer's specifications ensuring proper safety procedures are followed. Ensure the larger front pads are positioned under the front feet (or wheels) and the smaller rear pads are installed at the back of the unit. Lower the treadmill into place and ensure that the feet are centred in the middle of the mounts. This will allow for even deflection to occur on the mount.

Please contact the TVS technical team for advice on use with specific treadmill models.

Total Vibration Solutions Ltd
Unit 9, The Courtyard, Grane Road, Haslingden, Rossendale, Lancashire, BB4 4QN United Kingdom
Tel: +44(0)1706 260 220 | Fax: +44(0)1706 260 240 | Email: sales@totalvibrationsolutions.com
www.totalvibrationsolutions.com

01

APPENDIX H: Sound Insulation Testing Results



Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

Client: ATF Hayling Island

Site: ATF Hayling Island

Date of test: 27/07/2023

Identification:

Gym to Neighbour Bedroom 2

Description of the building construction:

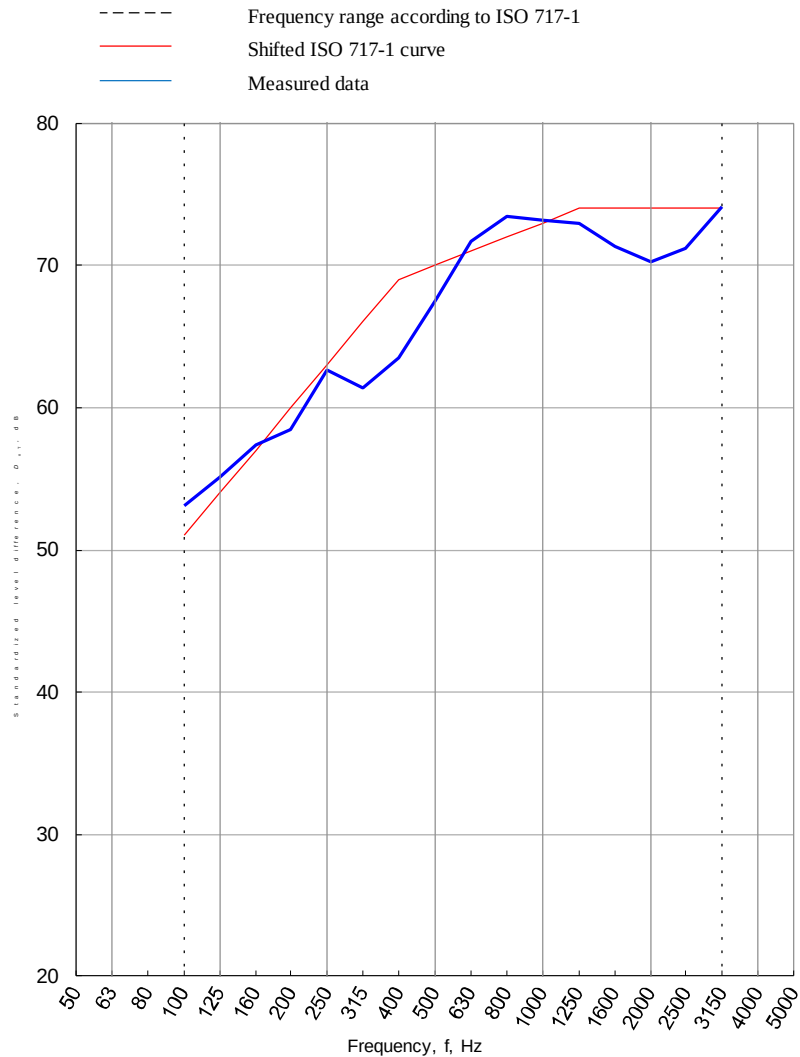
N/A

Test arrangement:

N/A

Frequency f [Hz]	D_{nT} 1/3 octave [dB]
50	
63	
80	
100	53.1
125	55.1
160	57.4
200	≥ 58.4
250	62.6
315	61.4
400	63.5
500	67.5
630	71.7
800	73.5
1000	≥ 73.2
1250	73.0
1600	71.3
2000	70.2
2500	≥ 71.2
3150	≥ 74.1
4000	
5000	

≥ = limit of measurement



Rating according to ISO 717-1

$D_{nT,w}(C;C_{tr}) = 70 \text{ (-1 ; -4) dB}$

Evaluation based on field measurements results obtained in one-third-octave bands by an engineering method.

$C_{50-3150} = \text{dB}$ $C_{50-5000} = \text{dB}$ $C_{100-5000} = \text{dB}$

$C_{tr,50-3150} = \text{dB}$ $C_{tr,50-5000} = \text{dB}$ $C_{tr,100-5000} = \text{dB}$

Test report : J1489/2

Name of test institute : Gillieron Scott Acoustic Design

Date : 27 July 2023

Signature :

Daniel Stuart

Standardized level difference according to BS EN ISO 140-4

Field measurements of airborne sound insulation between rooms

Client: ATF Hayling Island

Site: ATF Hayling Island

Date of test: 27/07/2023

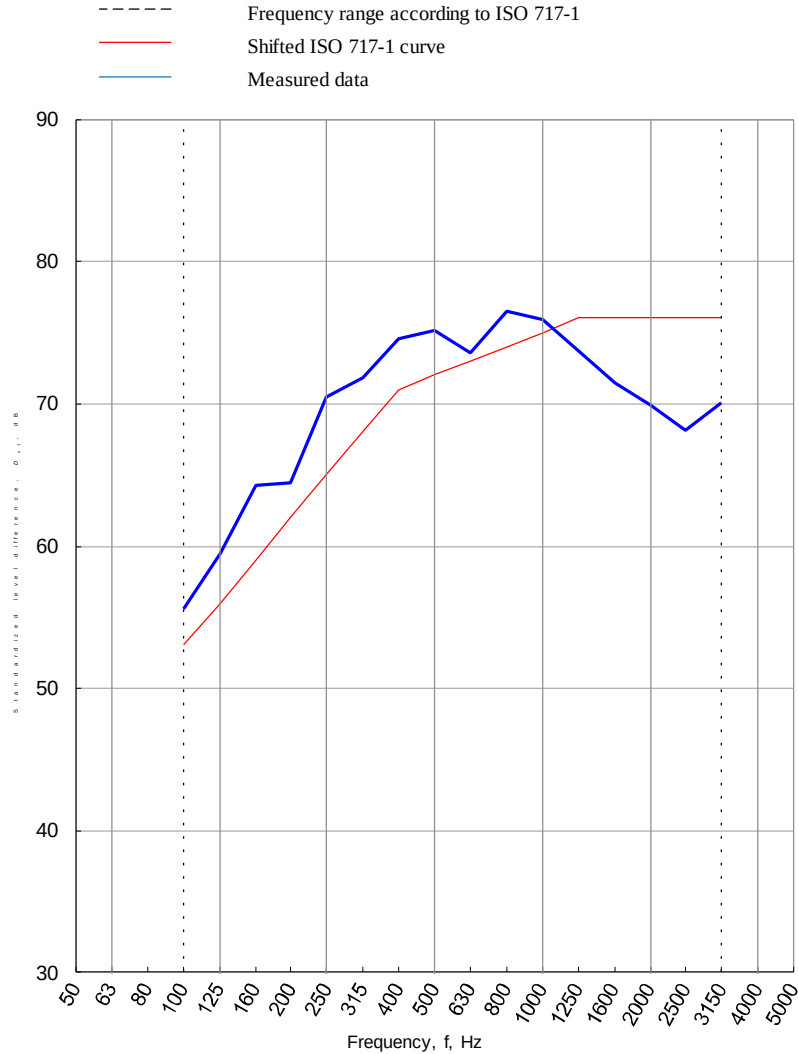
Identification:
Gym to Neighbour Livingroom

Description of the building construction:
N/A

Test arrangement:
N/A

Frequency f [Hz]	D_{nT} 1/3 octave [dB]
50	
63	
80	
100	55.6
125	≥ 59.5
160	≥ 64.2
200	≥ 64.4
250	≥ 70.5
315	71.8
400	74.6
500	≥ 75.2
630	≥ 73.6
800	≥ 76.5
1000	≥ 75.9
1250	≥ 73.7
1600	≥ 71.5
2000	≥ 69.9
2500	≥ 68.1
3150	≥ 70.1
4000	
5000	

≥ = limit of measurement



Rating according to ISO 717-1

$$D_{nT,w}(C;C_{tr}) = 72 \quad (-1 \quad ; \quad -2) \text{ dB}$$

Evaluation based on field measurements results obtained in one-third-octave bands by an engineering method.

$$C_{50-3150} = \text{dB} \quad C_{50-5000} = \text{dB} \quad C_{100-5000} = \text{dB}$$

$$C_{tr,50-3150} = \text{dB} \quad C_{tr,50-5000} = \text{dB} \quad C_{tr,100-5000} = \text{dB}$$

Test report : J1489/3

Name of test institute : Gillieron Scott Acoustic Design

Date : 27 July 2023

Signature :

Daniel Stuart